

1713  
18

PATENT  
Customer No. 22,852  
Attorney Docket No. 1435-120

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: )  
)  
Manfred Bochmann et al. ) Group Art Unit: 1713  
)  
Serial No.: 09/924,603 ) Examiner: Not Yet Assigned  
)  
Filed: August 9, 2001 )  
)  
For: Metal Complexes as Catalyst )  
Component for Olefin )  
Polymerization )

Assistant Commissioner for Patents  
Washington, DC 20231

Sir:

RECEIVED  
NOV 06 2001  
TC 1703

**PRELIMINARY AMENDMENT**

Before examination, please amend this application as follows:

**IN THE SPECIFICATION:**

Please amend the specification as follows:

Page 1, before line 1, insert: the following new paragraph:

This application is a continuation of international application

No. PCT/GB99/04350 filed December 22, 1999.

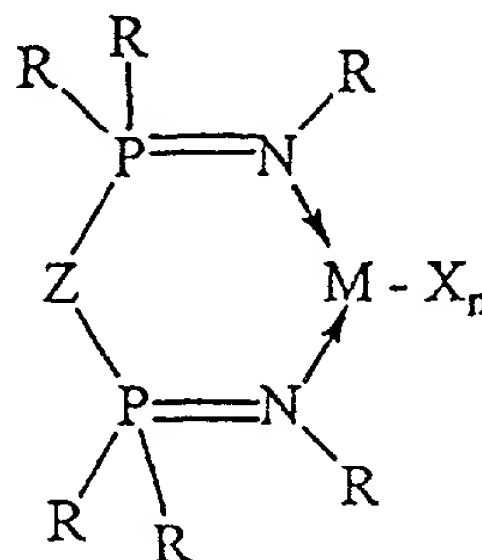
LAW OFFICES

FINNEGAN, HENDERSON,  
FARABOW, GARRETT,  
& DUNNER, L.L.P.  
1300 I STREET, N. W.  
WASHINGTON, DC 20005  
202-408-4000

**IN THE CLAIMS:**

Cancel claims 1-19 and substitute therefore the following new claims:

20. A transition metal complex having the formula



**FORMULA I**

wherein M is Fe[II], Fe[III], Co[I], Co[II], Co[III], Mn[I], Mn[II], Mn[III], Mn[IV], Ru[II], Ru[III] or Ru[IV]; X represents an atom or group covalently or ionically bonded to the transition metal M;

R is independently selected from hydrogen, halogen, hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl or substituted heterohydrocarbyl;

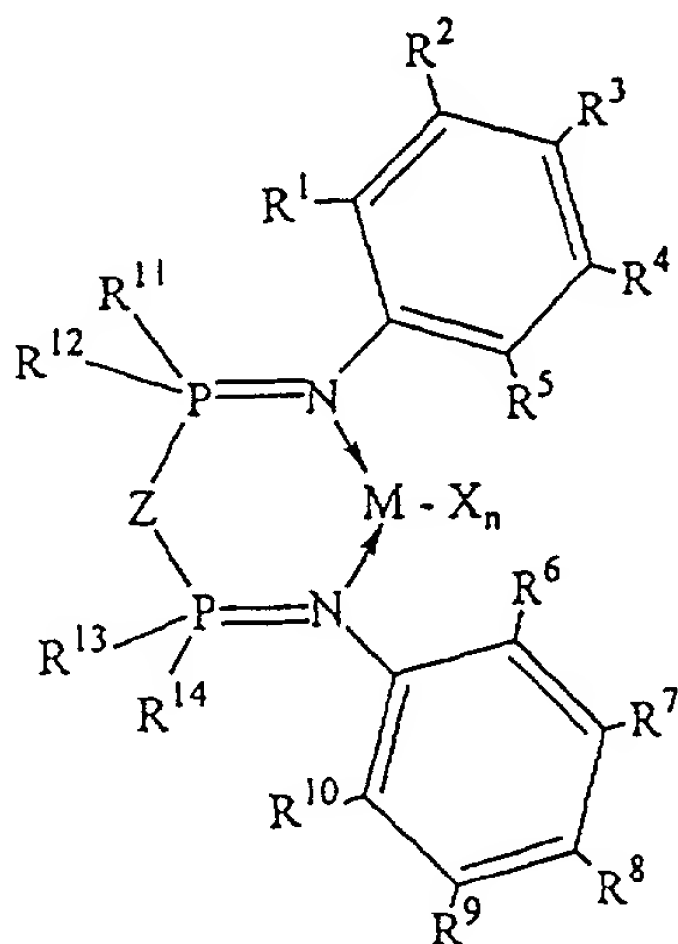
Z is a bridging group comprising a donor atom of N, P or S or alternatively is a neutral group comprising a C<sub>1-4</sub> alkylene group, a silyl or germyl group, and

n = an integer to satisfy the valency of M.

LAW OFFICES

FINNEGAN, HENDERSON,  
FARABOW, GARRETT,  
& DUNNER, L.L.P.  
1300 I STREET, N. W.  
WASHINGTON, DC 20005  
202-408-4000

21. A transition metal complex having the formula:

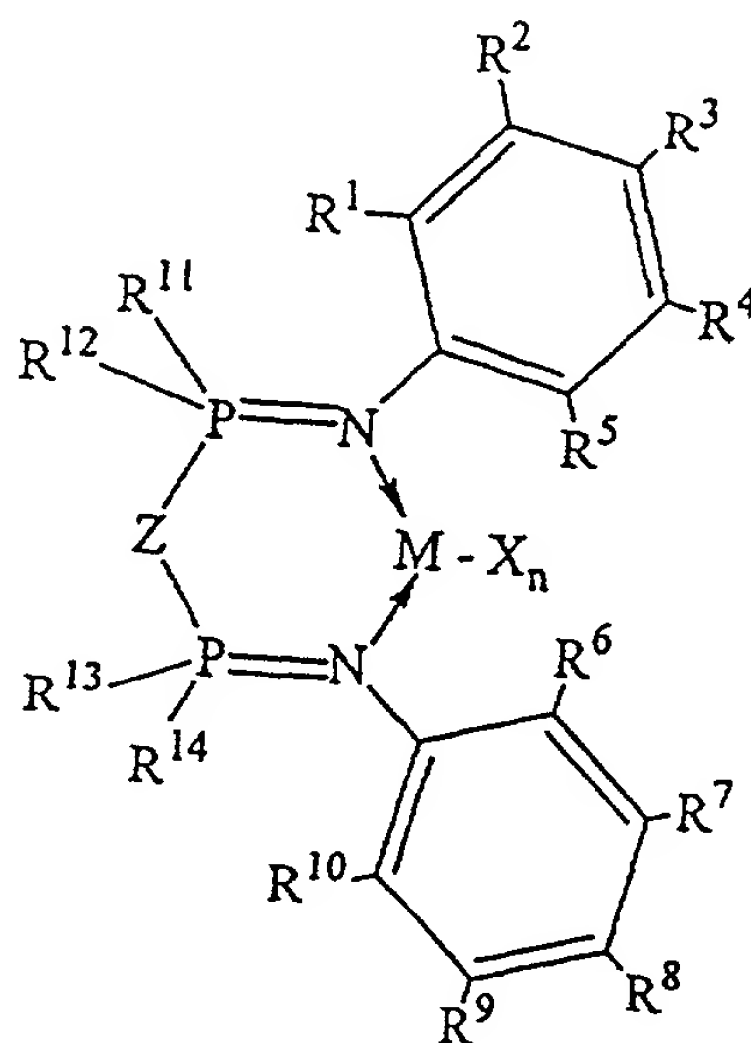


wherein M is Fe[II], Fe[III], Co[I], Co[II], Co[III], Mn[I], Mn[II], Mn[III], Mn[IV], Ru[II], Ru[III] or Ru[IV]; X represents an atom or group covalently or ionically bonded to the transition metal M; Z is a bridging group comprising a donor atom of N, P or S or alternatively is a neutral group comprising a C<sub>1-4</sub> alkylene group, a silyl or germyl group, R<sup>1</sup>-R<sup>14</sup> are independently selected from hydrogen, halogen, hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl or substituted heterohydrocarbyl, and n = an integer to satisfy the valency of M.

LAW OFFICES

FINNEGAN, HENDERSON,  
FARABOW, GARRETT,  
& DUNNER, L.L.P.  
1300 I STREET, N. W.  
WASHINGTON, DC 20005  
202-408-4000

22. A complex having the formula:



wherein M is Fe[II], Fe[III], Ni[II], Co[I], Co[II], Co[III], Mn[I], Mn[II], Mn[III], Mn[IV], Ru[II], Ru[III], Ru[IV], Pd[II], V[III], V[IV] or V[V];

X represents an atom or group covalently or ionically bonded to the transition metal M;

Z is a bridging group comprising a donor atom of N, P or S or alternatively is a neutral group comprising a C<sub>1-4</sub> alkylene group, a silyl or germyl group,

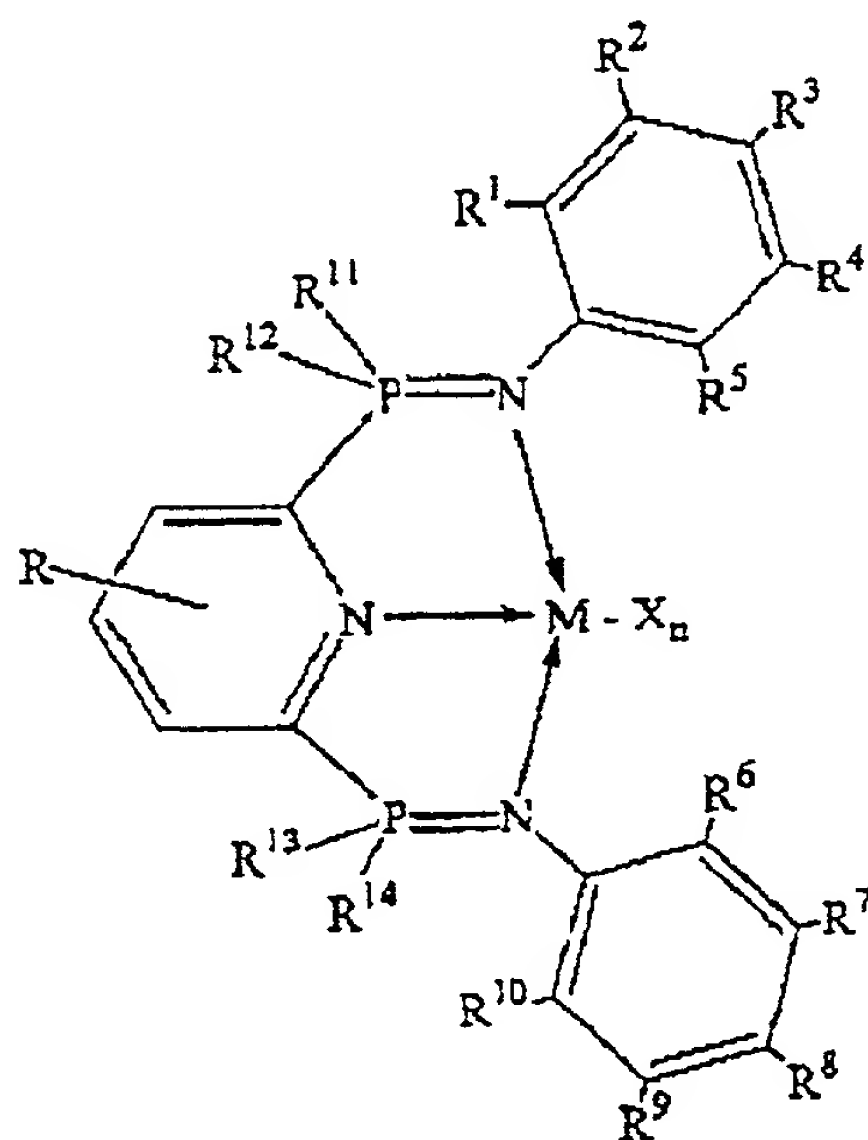
R<sup>1</sup>-R<sup>14</sup> are independently selected from hydrogen, halogen, hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl, or substituted heterohydrocarbyl, and at least one of R<sup>1</sup>-R<sup>10</sup> contains two or more carbon atoms, and

n = an integer to satisfy the valency of M.

23. The complex of claim 21 or 22 wherein R<sup>11</sup>-R<sup>14</sup> are phenyl, alkyl or cycloalkyl.

24. The complex of claim 20, 21, or 22 wherein the bridging group Z is -CH<sub>2</sub>- or a donor atom N.

25. The complex of claim 21 or 22 having the formula



wherein  $R$  is hydrogen or hydrocarbyl.

26. The complex of claim 20, 21, or 22 wherein the metal  $M$  is Fe or Co.
27. The complex of claim 20, 21, or 22 wherein the Group  $X$  is chloride.
28. A polymerization catalyst comprising
- (1) a transition metal complex as defined in claim 20, 21, or 22, and
  - (2) an activating quantity of an activator compound.
29. The catalyst of claim 28 wherein the activator compound is an organoaluminum compound or a hydrocarbylboron compound.
30. The catalyst of claim 28 further comprising a neutral Lewis base.
31. The catalyst of claim 28 further comprising a support.
32. The catalyst of claim 31 wherein the support is silica, alumina, or zirconia or is a polymer or prepolymer.

LAW OFFICES

FINNEGAN, HENDERSON,  
FARABOW, GARRETT,  
& DUNNER, L.L.P.  
1300 I STREET, N. W.  
WASHINGTON, DC 20005  
202-408-4000

33. The catalyst of claim 28 further comprising a catalyst suitable for the polymerization of olefins of the type used in Ziegler-Natta catalyst systems, metallocene-based catalysts, monocyclopentadienyl- or constrained geometry based catalysts, or heat activated supported chromium oxide catalysts.

34. A process for the polymerization or copolymerization of olefins comprising contacting a monomeric olefin under polymerization conditions with a catalyst as defined in claim 28.

35. The process of claim 34 wherein the polymerization conditions are solution phase, slurry phase or gas phase.

36. The process of claim 35 wherein the polymerization is conducted under gas phase fluidized bed conditions.

37. The process of claim 36 wherein the polymerization is conducted under condensed mode.

38. The process of claim 34 wherein hydrogen is used to control the average molecular weight of the polymer.

#### **REMARKS**

Claims 1-19 have been canceled and replaced by new claims 20-38 to conform the claims to the claims as amended under Article 34 during the international stage. In addition, the claims have been amended to avoid improper multiple dependency.

Examination of claims 20-38 is requested.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated: November 2, 2001

By:   
Arthur S. Garrett  
Reg. No. 20,338

222967\_1

2001 NOV 02 10 00 AM

LAW OFFICES

FINNEGAN, HENDERSON,  
FARABOW, GARRETT,  
& DUNNER, L.L.P.  
1300 I STREET, N. W.  
WASHINGTON, DC 20005  
202-408-4000